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COGNITIVE IMPAIRMENT AND MENTAL DISORDERS IN HIV-INFECTED PATIENTS WITH EARLY STAGES OF SYPHILIS

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The objective of the study was to determine the correlations between cognitive impairment in HIV-infected patients with early syphilis and mental disorders. 65 HIV-infected patients with early syphilis were examined by a clinical method and BNCE test. We revealed a high incidence of addictions (46.2%). Cognitive impairment was found in 43.1% of patients and was characterized by mild cognitive disorders. The severity of cognitive impairment was linked to hepatitis C co-infection ($R = -0.38$, $p = 0.003$), substance abuse ($R = -0.39$, $p = 0.002$) and intravenous drug use ($R = -0.51$, $p < 0.0001$). Cognitive impairment was associated with mental disorders due to brain damage ($R = -0.93$; $p < 0.0001$), dependence on stimulants ($R = -0.69$; $p = 0.014$), opiate dependence ($R = -0.48$; $p < 0.001$), and dependence on alcohol ($R = -0.28$; $p = 0.037$). Refs 15. Tables 2.

Keywords: cognitive impairment, mental disorders, HIV, syphilis, neurosyphilis.

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КОГНИТИВНЫЕ И ПСИХИЧЕСКИЕ НАРУШЕНИЯ У ВИЧ-ИНФИЦИРОВАННЫХ С РАННИМ СИФИЛИСОМ

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Исследование посвящено определению корреляции между когнитивными нарушениями и психическими расстройствами у ВИЧ-инфицированных пациентов с ранним сифилисом. Были обследованы 65 ВИЧ-инфицированных пациентов с ранним сифилисом с использованием клинического и экспериментально-психологического методов (в том числе методики «КНОКС»). Выявлена высокая частота зависимостей (46,2%). Когнитивные нарушения были обнаружены у 43,1% пациентов и характеризовались умеренными когнитивными расстройствами. Тяжесть когнитивных нарушений была связана с выявленной у пациентов коинфекцией гепатитом C ($R = -0,38$, $p = 0,003$), злоупотреблением психоактивными веществами ($R = -0,39$, $p = 0,002$) и внутривенным потреблением наркотиков ($R = -0,51$, $p < 0,0001$). Когнитивные нарушения были связаны с психическими расстройствами вследствие органического поражения головного мозга ($R = -0,93$; $p < 0,0001$), зависимостью от стимуляторов ($R = -0,69$; $p = 0,014$), опиатов ($R = -0,48$; $p < 0,001$) и алкоголизма ($R = -0,28$; $p = 0,037$). Библиогр. 15 назв. Табл. 2.

Ключевые слова: когнитивные нарушения, психические расстройства, ВИЧ, сифилис, нейро-сифилис.

The number of HIV-infected people in the Russian Federation could be 1–2% of the total population, or more than 5% of the adult population [1]. HIV affects the central nervous system in the first weeks after infection, as proved by the identification of the virus in the CSF during this period [1]. Penetrating into the central nervous system, HIV infects microglia and perivascular macrophages [2]. HIV-associated neurocognitive disorders (HAND) are found in 84% of HIV-infected patients, asymptomatic HAND (according to Antinori A. et al. [3] classification) have been reported in 24–33% of patients [4]. Since the beginning of the use of highly active antiretroviral therapy, the prevalence of severe HAND has significantly decreased, while the problem of mild disorders remains actual [5].

Syphilis affects the central nervous system within a few weeks or months after infection [6]. Neurosyphilis develops in 30 % of patients with untreated syphilis [7].

Comorbidity of syphilis and HIV varies from 20 to 73 % [8]. Syphilis increases the risk of HIV transmission [9]. HIV-infection can alter the natural history and clinical manifestations of syphilis [10].

Mental disorders affect the HAND. Cognitive impairment is found to be worse in HIV positive individuals with psychosis as compared to HIV negative individuals with psychosis [11]. The impact of alcohol abuse and drug addiction on the cognitive function of patients is well known [12]. Stigma and low social adaptation have direct and indirect effects on cognitive function of patients [13].

We found only one study of the problem of cognitive impairment associated with HIV infection and syphilis. The main conclusion of the study is that HIV-infected patients with prior syphilis have a higher level of cognitive impairment as compared to HIV-infected patients who have never had syphilis [14].

The aims of our study were to evaluate the structure of cognitive impairment and mental disorders in HIV-infected patients with early syphilis and to determine the correlations between cognitive impairment in HIV-infected patients with early syphilis and mental disorders in these patients.

Study material. Sixty-five HIV-infected patients with different forms of early syphilis were examined in dermatovenereologic clinic. The sample included 45 men (average age 32.09 ± 9.83) and 20 women (average age 31.7 ± 5.97).

Study Methods. Semi-structured clinical interview and structured clinical questionnaire were used in this study. Cognitive impairment was assessed using the technique called The Brief Neuropsychological Cognitive Examination ("BNCE") [15] Tonkonogy J.M., 1997). Statistical processing was carried out using a core set of parametric and non-parametric methods (Statistica 10.0; mean (M), standard deviation (m), Kruskal-Wallis test, chi-square test, Pearson's or Spearman's correlation tests).

Results. HIV was diagnosed for the first time in 30 % of women and almost half of men (48.9%). The average time since the diagnosis of HIV in other patients was 3.11 ± 3.84 years in women and 2.69 ± 1.78 years in men. Hepatitis C and hepatitis B co-infection were diagnosed in 43.1 % and 24.6 % of patients, respectively.

Mental disorders made up 83 % of the total number. We revealed a high incidence of addictions (46.2 %) and mood disorders. Adjustment disorders (F43, ICD-10) and dependence on alcohol (F10) were the most prevalent disorders in patients and constituted 32.3 % of patients each. Opiate dependence (F11) was established in 18.5 % of patients. Dependence on multiple drug use (F19; including opiate dependence in all cases) and dependence on stimulants (F15) were revealed in 13.8 % and 4.6 % of patients respectively. Depressive episode was diagnosed only in women (F32; 6.2 %). Personality disorders (F60) and mental disorders due to brain damage (F06) formed 15.4 % and 13.9 % of patients respectively.

Cognitive impairment accounted for 43 % of patients. When we first began to look into the question of cognitive impairment in HIV-infected patients with syphilis, we suggested that neurosyphilis disease, confirmed with a spinal puncture, affected the severity of cognitive impairment in patients. However, no difference in the level of cognitive impairment between HIV-infected patients with early syphilis and HIV-infected patients with early neurosyphilis was identified (table 1).

Table 1. Cognitive impairment in HIV-infected patients with early syphilis and early neurosyphilis (BNCE test results)

BNCE	HIV-infected patients		P
	with syphilis (n = 37)	with neurosyphilis (n = 28)	
Total value	27.19 ± 2.24	27.59 ± 2.17	0.48
Orientation	2.69 ± 0.47	2.93 ± 0.27	0.025
Presidents memory	2.42 ± 0.5	2.52 ± 0.58	0.458
Naming	2.92 ± 0.28	3.0 ± 0.0	0.128
Comprehension	2.83 ± 0.38	2.81 ± 0.48	0.865
Constructive praxis	2.97 ± 0.17	2.93 ± 0.27	0.401
Part 1 value	13.83 ± 0.97	14.19 ± 1.0	0.165
Shifting set	2.5 ± 0.61	2.7 ± 0.47	0.153
Incomplete pictures	2.89 ± 0.4	2.89 ± 0.32	1.0
Similarities	2.53 ± 0.74	2.56 ± 0.75	0.88
Attention	2.58 ± 0.55	2.48 ± 0.58	0.482
Working Memory	2.86 ± 0.35	2.78 ± 0.51	0.443
Part 2 value	13.44 ± 1.56	13.41 ± 1.47	0.92

The presence of cognitive impairment was significantly associated with lower counts of CD-4 lymphocytes in the blood (343.53 ± 223.93 and 506.38 ± 221.96 ; $p = 0.038$; $R = -0.36$, $p = 0.031$). Correlations between HAND and brain injuries, the stage of HIV infection, the time elapsed after being infected and the viral load in the blood were not identified.

According to BNCE test, all patients with Cognitive impairment were characterized by mild cognitive disorders (asymptomatic neurocognitive impairment in Antinori A. [et al.] classification) (table 2). Most of subtests values were significantly lower than the reference values. Patients with cognitive impairment were characterized by visuospatial agnosia, visuomotor memory and coordination impairment, intellectual impairment with the decline in abstraction ability.

The severity of cognitive impairment, according to the BNCE test results, was linked to the following factors: hepatitis C co-infection ($R = -0.38$, $p = 0.003$), substance abuse ($R = -0.39$, $p = 0.002$) and intravenous drug use ($R = -0.51$, $p < 0.0001$).

Cognitive impairment in patients without mental disorders was found significantly less frequently ($R = 0.58$; $p < 0.001$). Cognitive dysfunction was associated with mental disorders due to brain damage ($R = -0.93$; $p < 0.0001$), dependence on stimulants ($R = -0.69$; $p = 0.014$), opiate dependence ($R = -0.48$; $p < 0.001$), and dependence on alcohol ($R = -0.28$; $p = 0.037$). Patients with adjustment disorders were less likely to suffer from cognitive impairment ($R = 0.27$; $p = 0.047$). Social adaptation of patients with HAND was often assessed as low ($R = 0.47$, $p < 0.001$).

Conclusion. This study showed that cognitive impairment occurs in 43 % of HIV-infected patients with early syphilis. Cognitive dysfunction is more common in HIV-infected patients with comorbid mental disorders (mental disorders due to brain damage and addictions) and affects their social adaptation. Manifestations of cognitive impairment in HIV-infected patients with early syphilis include visuospatial agnosia, intellectual

Table 2. The structure of cognitive impairment in HIV-infected patients with early syphilis (BNCE test results)

BNCE	HIV-infected patients		P
	with cognitive impairment (n = 28)	Reference value	
Total value	25.36 ± 1.66	28–30	<0.001
Orientation	2.61 ± 0.49	3	<0.001
Presidents memory	2.18 ± 0.48	3	<0.001
Naming	2.93 ± 0.26	3	0.17
Comprehension	2.68 ± 0.55	3	0.005
Constructive praxis	2.89 ± 0.31	3	0.071
Part 1 value	13.29 ± 1.01	14–15	0.004
Shifting set	2.29 ± 0.59	3	<0.001
Incomplete pictures	2.75 ± 0.52	3	0.017
Similarities	2.18 ± 0.90	3	<0.001
Attention	2.25 ± 0.59	3	<0.001
Working Memory	2.61 ± 0.57	3	0.001
Part 2 value	12.18 ± 1.41	14–15	<0.001

impairment and visuomotor memory and coordination impairment. Early neurosyphilis has no effect on clinical manifestations of cognitive impairment in HIV-infected patients.

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